

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-3      Cancelled

4.      (Amended) A system for detecting acoustic signals in the producing area of a well bore, comprising:

an optical fiber having a core and a cladding layer;

at least one periodic refractive index perturbation formed in the optical fiber at a location of the fiber to be deployed in the producing area of a well, the optical fiber and at least one periodic refractive index perturbation forming a sensor having a characteristic that varies in response to acoustic signals;

an optical interrogator in optical communication with the optical fiber, the optical interrogator for transmitting light down the optical fiber and for receiving light reflected by the at least one periodic refractive index perturbation formed within the fiber, ;

a processor programmed to analyze the reflected light to detect the variations of the characteristic of the sensor to detect the presence of sand within the producing area of the well bore; and

means responsive to the processor for reporting the presence of sand within the well bore to an operator.

Claim 5 (Cancelled)

6.      The system of claim 4, wherein the at least one periodic refractive index perturbation and a selected length of optical fiber form an acoustic sensor.

7.      The system of claim 6, wherein the acoustic sensor is configured to be mounted on an external side of a well casing.

8. (New) The system of claim 4, wherein the at least one periodic refractive index perturbation is a Bragg grating.

9. (New) The system of claim 4, wherein the processor is programmed to perform time domain analysis.

10. (New) The system of claim 4, wherein the processor is programmed to perform frequency domain analysis.

11. (New) The system of claim 4, wherein the processor is programmed to analyze the reflected light to discriminate between the presence of sand in the producing area of the well bore and another acoustic event detected within the producing area of the well and the means for reporting is also responsive to the processor to report the other acoustic event to the operator.

12. (New) The system of claim 4, wherein the means for reporting provides an indication to the operator that action is required to minimize damage to the well bore.

13. (New) The system of claim 11, wherein the means for reporting provides an indication to the operator that action is required to minimize damage to the well bore.